

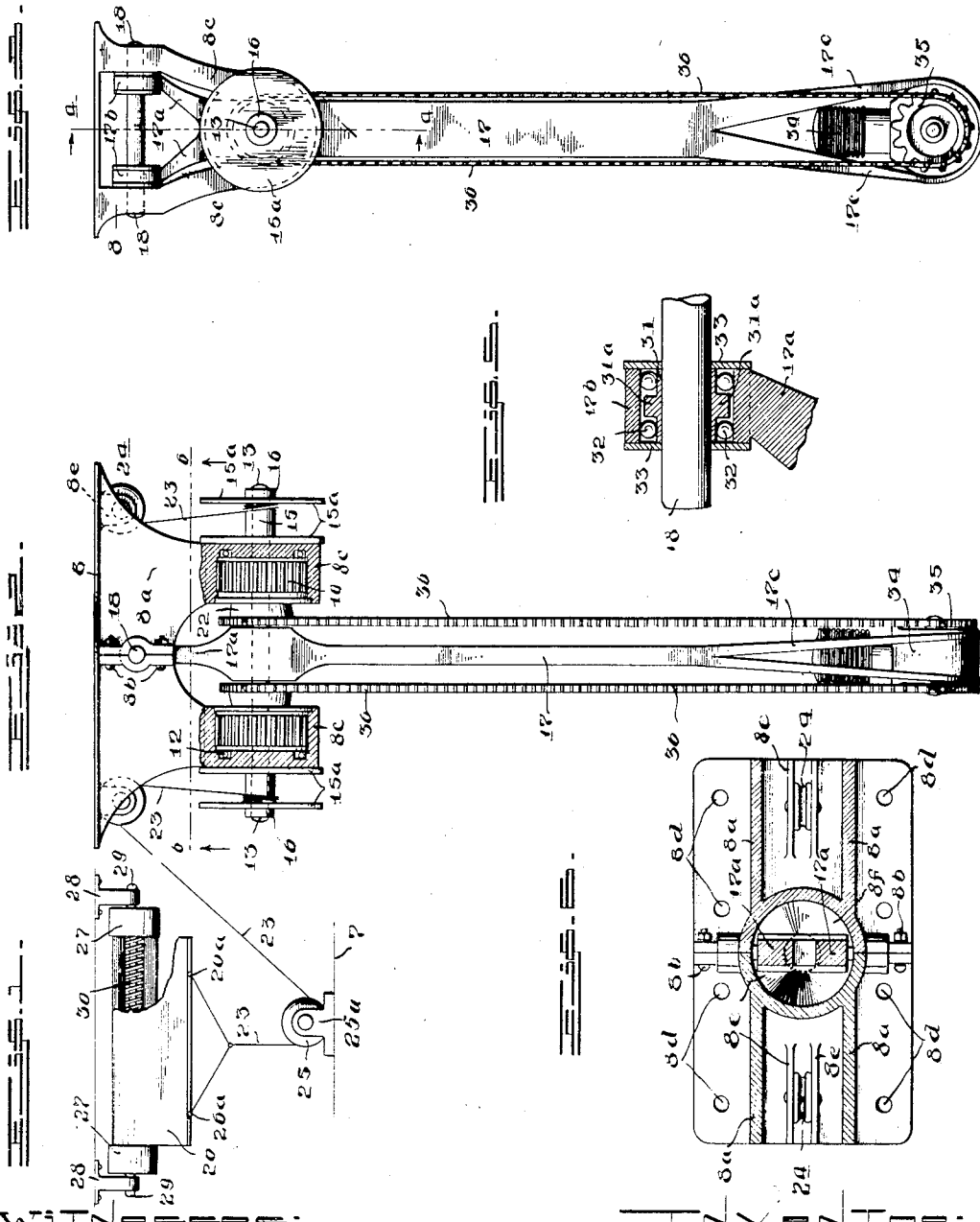
A. HUTH.
AERODROME.

APPLICATION FILED JUNE 5, 1912.

1,056,179.

Patented Mar. 18, 1913.

3 SHEETS—SHEET 1.

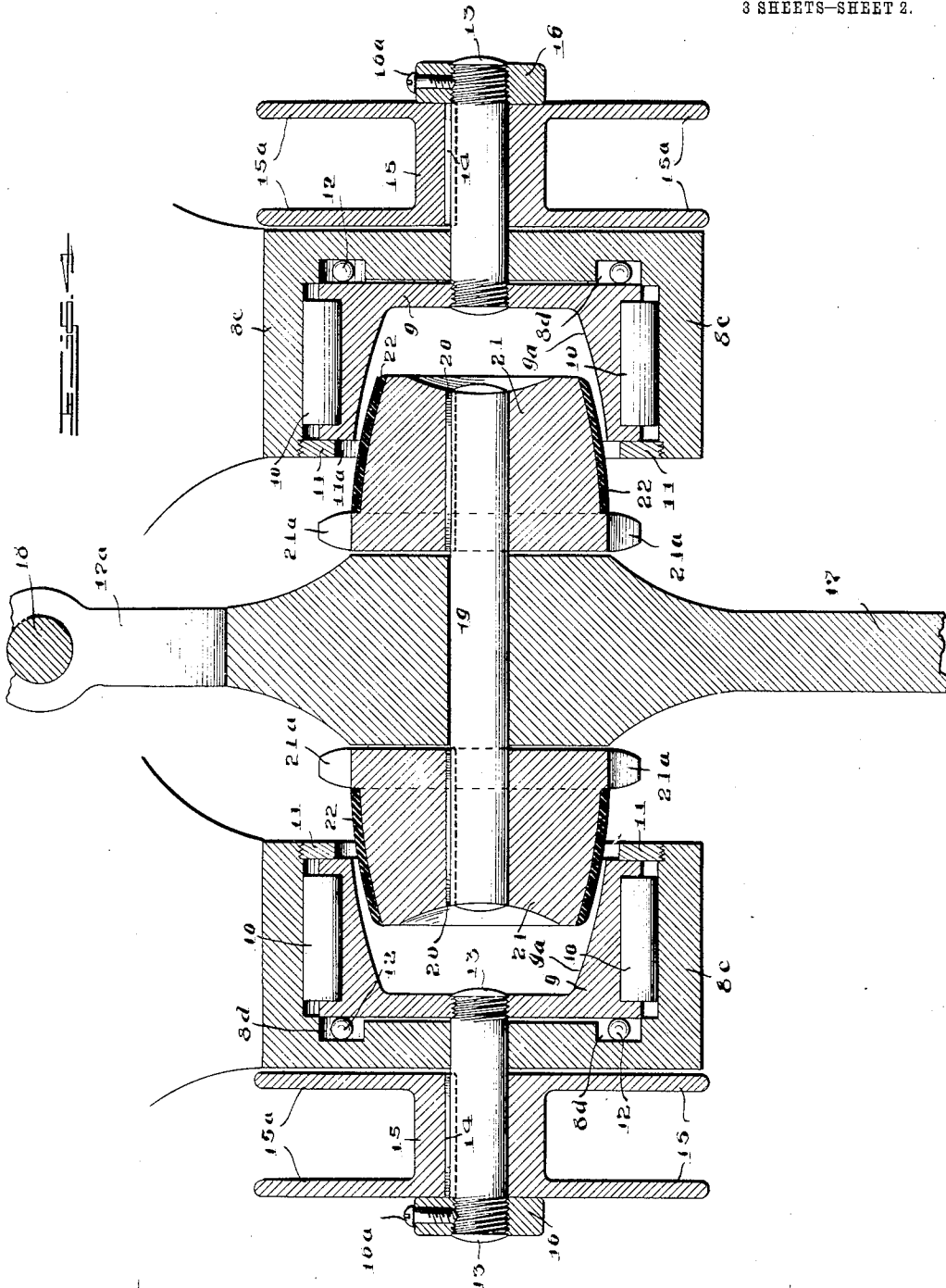


Witness:
 Mr. Harold Eckelmay, Alvin Huth
 M. A. Milord, Frederick Benjamin

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3 SHEETS—SHEET 2.



WITNESSES:
Wm. Harold Eckelmayr.
m A Milord

INVENTOR:
Alvin Huth
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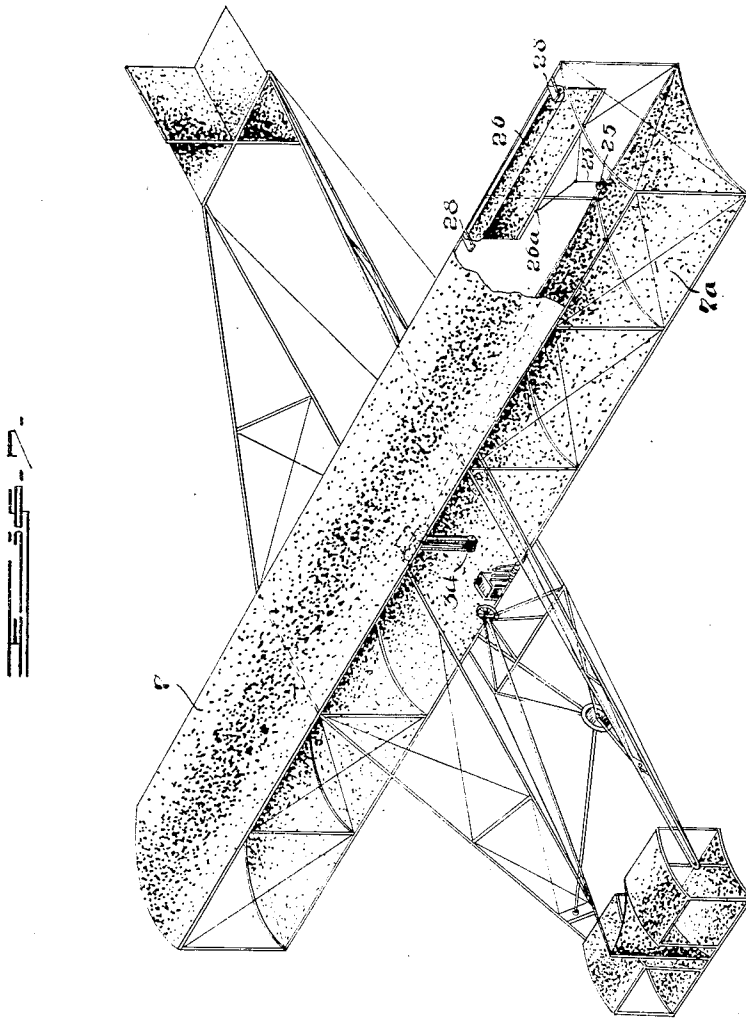
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Mr. Harold Eckelmann,
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UNITED STATES PATENT OFFICE.

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AERODROME.

1,056,179.

Specification of Letters Patent.

Patented Mar. 18, 1913.

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To all whom it may concern:

Be it known that I, ALBIN HUTH, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Aerodromes, of which the following is a specification.

This invention relates to improvements in aerodromes or flying machines, and more especially to means for maintaining the lateral balance or equilibrium of the machine through the instrumentalities of supplemental vanes which are connected with the main planes and are automatically operated as a result of the lateral tilting of the machine, and whose effective area is increased or diminished as required to restore the machine to normal or safe position.

In carrying out the principles embodied in my invention, I have utilized the law of gravity augmented by mechanically driven means which operating together effect the desired result as will be specifically pointed out hereinafter.

In the accompanying drawings I have illustrated, and will hereinafter describe, one mechanical embodiment of my invention, with the understanding that my invention is applicable to any form of aerial bi-plane or monoplane, and that any preferred means may be utilized of applying power to the stabilizing devices employed. I also desire to go on record as not being limited to any specific form of adjustable vane or to any particular location of same in a machine.

In the accompanying drawing, I have shown one adaptation of my invention to a flying machine of the bi-plane type in the following views:—Figure 1 shows in elevation a perspective view of a bi-plane flying machine to which my stabilizing invention is applied, a portion of one plane being broken away to disclose the relative position of one vane; Fig. 2 is a view partly in elevation and partly in section of the vane operating mechanism; Fig. 3 is an elevation of the parts shown in Fig. 2, and at right angles thereto; Fig. 4 is an enlarged sectional view of the clutch mechanism which forms an important feature of my invention; Fig. 5 is a sectional detail of a ball-bearing which I prefer to employ in conjunction with my invention; Fig. 6 is a cross-sectional view on the line 6—6 of Fig. 2; Fig. 7 is a detail partly in elevation and

partly in section of one of the stabilizing vanes forming a part of my invention.

Referring to the details of the drawing, 7 represents generally the top plane of a flying machine equipped with my invention, and 8 the bracket which supports the vane operating parts of my invention. This bracket is made in two twin sections 8^a, 8^a, connected rigidly together by bolts 8^b which pass through central lateral flanges, and are provided with bails 8^a in their top portions to receive the suitable bolts by which they may be secured to the frame work at the under side of the upper plane at a point midway the ends of the latter. From the lower portions of the brackets depend hangers in the form of cylindrical extensions 8^c, and from the top of the brackets depend hangers 8^c. In the hangers 8^c are mounted roller bearings consisting of a cup-shaped sleeve formed with an annular groove in which are seated the rollers 10 which extend around the periphery of said member. The member 9 is held in place by a ring-nut 11 which is threaded into the extension 8^c, as clearly shown in Fig. 4, and on the opposite face, said member bears against a series of balls 12 arranged in a race-way 8^d formed in the adjacent face of the extension 8^c. The center of the outer wall of the extension 8^c is tapped to receive one end of a spindle 13, to which is secured by a splined connection 14, a spool 15 having deep flanges 15^a, and said spool is held in place on the spindle by a nut 16 and a set screw 16^a tapped into the nut and impinging on the spindle. The inner face of the roller carrying sleeve 9 is formed concave and flaring as shown at 9^a.

From a shaft 18 which is clamped between the bracket sections 8^a, 8^a, is hung a pendulum-like shaft 17, which is formed with spreading arms 17^a which terminate in round bosses through which the shaft 18 passes. The lower third of the pendulum is bifurcated as at 17^c to form a sling which supports the motor 34 on the driven shaft of which are fixed sprocket wheels 35 over which travel sprocket chains 36, which also engage sprocket teeth 21^a formed on the inner ends of the pulleys 21. These pulleys are splined by key 20, on a shaft 19 journaled in the upper portion of the pendulum or sling 17. Each pulley 21 is convexly curved to conform to the concave face of the sleeve 9, and is faced with a rubber

or raw-hide covering 22 which insures a more effective frictional engagement between pulley and sleeve. The relative arrangement and proportions of sleeves and pulleys are such that when the pendulum hangs in a true perpendicular plane neither sleeve is engaged, but as soon as it swings to an appreciable degree, the pulley and sleeve on the side toward which the pendulum swings will be brought into engagement, all of which will clearly appear from Fig. 4.

Connected with each spool 15 is a cord or flexible wire 23 which makes over a sheave 24 mounted in a hanger 8^c, (Fig. 6) from which it passes downwardly and under a sheave 25 mounted in a suitable bracket secured to the lower plane 7^a, from which the cord passes upwardly and is divided and its ends secured at 26^a to the lower edge of a stabilizing vane 26. This vane is essentially a curtain of suitable material and proportions and is secured to and wound upon a roller 27 the pintles 29 of which are journaled in hangers 28 which are suitably secured to the under side, and at the rear edge of the top plane 7, as indicated in Fig. 1. The roller is equipped with the usual coil spring 30, the function of which is to keep the curtain wound upon the roller except when the stabilizing mechanism is in operation, and then the spring will keep the curtain taut so long as it is extended. It will be understood there are two of these vanes, one on each side of the center of the machine, and their exact position on the planes will be determined in each instance by the peculiarities of the flying machine to which they are applied. The same considerations will determine whether these stabilizing vanes will be arranged to extend vertically or horizontally, their function being to exert increased resistance when such is required to maintain or restore lateral

equilibrium to the machine to which they are applied. 45

While I have shown and described a motor directly attached to the shaft on which the sprockets 35 are mounted, it is obvious that such shaft may be driven directly from the propelling motor with which the flying machine is equipped, or the sprocket-driving motor may be itself driven from any suitable source of power. The weight of a motor at the lower end of the pendulum adds to the quickness and effectiveness of the pendulum as a gravity actuated element. 55

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:— 60

1. In a flying machine, stabilizing means comprising vanes adapted to be connected with the machine, means for holding said vanes under constant tension, a gravity acting pendulum secured to said machine, a driving member supported by said pendulum, clutches operated by said pendulum, and means connecting said vanes with said driving member whereby they will be extended. 70

2. In a flying machine, stabilizing means comprising vanes adapted to be connected with the machine, springs for holding said vanes under constant tension, a gravity acting pendulum secured to said machine, a motor carried by said pendulum, clutches alternately operated by the swinging of said pendulum, spools mounted on said machine, means connecting said spools with said vanes, and means connecting said motor with said spools. 75

In testimony whereof I affix my signature in the presence of two witnesses.

ALVIN HUTH.

Witnesses:

MICHEL WALTOR,
F. BENJAMIN.